

SOUTH AUSTRALIA.

MR. WINNECKE'S EXPLORATIONS DURING 1883.

Ordered by the House of Assembly to be printed, August 19th, 1884.

[Estimated cost of printing (650), £17 7s. 0d. Lithographing (1 plan), £37 15s. 0d.]

DIARY of NORTHERN EXPLORATION PARTY under the LEADERSHIP of MR. CHAS. WINNECKE.

After various delays at Adelaide, Beltana, and Farina, the party left the latter place on the 30th of July, 1883. The camels caused some trouble at starting, this being the first time they were fully loaded; each camel carried about eight hundred weight, including saddles, &c. We only made a short stage of fifteen miles, camping at sundown near Mundowadon Station.

Tuesday, July 31st.—Started after the camels at 5 a.m. and left camp at 8 a.m.; travelled all day. Camped five miles north of Mundowadon Station.

Wednesday, August 1st.—Started at 8·30, and camped at Nantowarpunna Waterhole. Two of our camels have sore backs.

Thursday, 2nd.—Started at 6·30 a.m.; travelled all day at a very slow pace. Camped at twenty-one miles, near Wyeculcuna Waterhole.

Friday, 3rd.—Started at 8 a.m.; travelled all day. Camped at sundown at Dulkaninna Waterhole; twenty-one miles.

Saturday, 4th.—An early start was made this morning from Dulkaninna. We travelled as before over stony plains, the only vegetation being a few low bushes of samphire, blue and salt hush. At twelve miles we arrived at Blanes Well, the native name of which is Ledracoordinanna. The well is situated amongst some low bare sandhills, and near a polygonum and boxwood flat, which is subject to inundation. The well is 95ft. deep, and contains a good supply of water, which rises 9ft. in the well. It is surrounded by a wall; a whim as well as a windlass have been erected over it; the latter, however, only is in use. Men are now engaged in putting up 100ft. of double-width iron troughing. The water tastes strongly of soda.

Sunday, 5th.

Monday, 6th.—We got a reasonably early start; one camel was most spiteful, and for a long time he defied our united efforts to load him. The sandhills only extend about half a mile around about the well, and we soon got on to the usual stony plains, which now undergo a slight change—small hillocks of hard compressed sandstone and flint, some of which plainly show the action of fire, are scattered about in all directions. At six miles we passed a small round hill composed of huge boulders of compressed sandstone. At nine miles we crossed the Isa Creek. The stony plains now assume a bolder appearance, and resemble miniature tablelands with many rough and abrupt slopes. At eighteen miles we crossed a tributary or back-water of Cooper's Creek, and arrived at Etadunna, an outstation of the Moravian missionaries; the place appeared deserted. After a time, three very old and feeble blackfellows made their appearance from amongst the sandhills. They informed us that the missionaries had all removed to Killalpaninna. After filling our water kegs, we continued our journey. The road now runs parallel to and on the eastern side of a heavily-timbered swamp or creek; the stony undulations recede from the creek for several miles, only approaching again at one point. The track passed over a level earthy plain, which shows many deep cracks and other signs of heavy inundations. At sunset we camped on a polygonum flat, several miles south of Kopperamanna, having travelled twenty-six miles.

Tuesday, 7th.—We made rather a late start this morning, leaving the polygonum flat about 8 o'clock; the delay was caused by the camels who had strayed away during the night. The road still continues along the creek and over an earthy flooded plain. At about two miles a large sandridge approaches the creek. The track now leaves the plain and enters the creek, which is about three and a half miles wide, and thickly timbered with stunted box timber. At two and a half miles the road crosses a well-defined sandy channel. At three and a half miles we arrived at Kopperamanna Station, which is now abandoned, and presents a very dilapidated appearance. It is composed of a few low mud huts and several brush sheepyards, and is situated in the middle of Cooper's Creek, close to the station. Kopperamanna Lake extends to the north-west and north. The track, which has hitherto been running about north, now takes a sharp turn to the east at half a mile. It crosses another sandy channel of Cooper's Creek which leads direct into Kopperamanna Lake. Three wells have been sunk in the bed of the creek near the crossing, and several more are visible about half a mile further down the creek; they are all about eight feet deep, and do not hold much water, which is slightly impregnated with soda. The track again turns in a northerly direction at one and a half miles across a heavily-flooded sandy flat, overgrown with box and polygonum bushes. We entered the cane-grass sandhills or ridges, which are devoid of timber and run in well defined and parallel ridges almost due north and south, with polygonum flats in between, which are inundated by the overflow of Cooper's Creek. At two and a half miles we got clear of all the floodmarks and properly into the sandhills (which are composed of a fine loose white drift sand). Cane grass becomes abundant. A few low bushes of acacia and saltbush grew in the valleys between the sandridges. At six miles from the wells we crossed a small polygonum flat or shallow waterhole. The natives have dug two or three wells here, which are now dry. The flat is surrounded with box trees, the only timber within many miles. At eleven miles from the wells, the sandridges, although still

maintaining

A

RET

84-08-02



maintaining their barren appearance, increase in size and open out, the flats in between becoming stony, and good camel feed more abundant. At fourteen miles we camped near Apatoonganie, or Neaylor's Well, an old and apparently deserted station. One of our camels has become crazy, and it is very dangerous work to manage him.

Wednesday, 8th.—Soon after leaving Apatoonganie this morning, the track ascends a gentle rise and we are again on the level stony cottonbush and saltbush plains. At one mile the Killalpaninna track branches off. At eight miles we passed to the east of a low table-top hill (Mulka Hill), and soon after crossed a narrow low sandridge, which has been running parallel to the track for the last ten miles or more. The road now crosses wide stony plains, with a single low sandridge at regular intervals; the ridges are perfectly straight for miles, and take an almost due north and south direction (more correctly they tend a little to the west of north about 9°). At thirteen miles, after crossing a low sandridge, we suddenly came to Lake Ooroowilanie, which we crossed, camping at fifteen miles on a sandhill near its eastern side. This lake is about two miles long and nearly half a mile wide, and is surrounded by sandhills. It is covered with green herbage which the camels seem to relish amazingly.

Thursday, 9th.—At daybreak this morning a few light showers of rain fell; this continued throughout the day, making travelling anything but pleasant. After crossing a low sandridge near the camp, the track continues over the usual stony plains, which are, if anything, more barren—no vegetation of any sort being visible for miles around. About one mile from last night's camp, and at the foot of the sandhills, a well or trial hole has been sunk; it is about 70ft. deep, and contains salt water. At six miles passed to the right of Taltra Hill; at twelve miles crossed a few low sandridges. The country now again improves in appearance; salt and cotton bush again becomes abundant. At twenty miles, after crossing a few low white sandhills, we camped near Mungeranie Waterhole, which is now quite dry; plenty of water, however, can be obtained from the Government well.

Friday, 10th.—A late start was made, the camels having travelled several miles in hopples during the night. The track crosses a few low sandhills on to a barren stony plain; at three and a half miles we crossed a small gum creek. The stony plains now change into low broken tableland with sandy valleys, devoid of any timber or bushes, the only vegetation being a few patches of cottonbush and cane grass in the valleys. At eight miles the country again becomes very level; at twenty-three miles we camped, being unable to proceed any further on account of a fearful hurricane. As far as the eye can reach, for miles around, nothing is visible excepting a red stony plain.

Saturday, 11th.—A furious and bitter cold wind continued to blow all night; rain also fell unceasingly from 6 o'clock last night until noon to-day: everything in the camp is saturated. About noon we saddled up and started for Cowarie Station, the country proving very slippery for the camels; the track continues over the same monotonous plains. At about two miles passed to the eastward of Berlino Station, and at six Chandler's Waterhole. The country now changes into low broken sandhills; the creek timber also improves in size and appearance. At ten miles we arrived at Cowarie Station, where we were most hospitably entertained by Mr. and Mrs. Helling.

12th, 13th, 14th and 15th.—During the following few days we were employed in arranging all necessary camp matters, such as making waterbags, packbags, &c.; we also killed a bullock, part of which was spiced, the rest salted.

Start.—Thursday, 16th.—We were astir by 4:30 a.m., but only managed to get under weigh by about 8:30 a.m. The party now consists of myself and two white men, and also a black boy, who volunteered to point out some waters to the northward. The first few (two and a half) miles of our journey lay across a sandy and stony flat. We then entered the flooded flats of the Warburton River; the flats are densely timbered with box, acacia, and high saltbush, and extend for miles in all directions. At seven miles we came to the junction of the Derwent Creek with the Warburton River, near a fine large waterhole, which our black boy called Kirrianthana. After crossing the Warburton River we continued in a north by west direction over flooded flats and several large claypans, and also a few sandridges, until we arrived at the Kallakoopah, which is a wide sandy creek, quite as large as the Warburton, and contains long and deep reaches of water. We had some difficulty in finding a crossing for the camels. The blackboy was not of the slightest use to us, although this is his country; he gave us to understand that the only way to get across would be by fording or swimming. We camped on the northern side of the creek and on the western end of a fine waterhole, which is said to extend for about twelve miles up the creek. The country travelled over to-day is well covered with salt and cotton bush.

Friday, 17th.—This morning our black boy, Moses, seemed confused and not to know which way to go; at last he started in an east by north direction; he led us in a very roundabout way for about four and a half miles over low cane-grass sandridges and flooded flats, overgrown with box, acacia, and high saltbush. We then made several decided turns to the north, and after travelling an additional twelve and a half miles over flooded flats, thickly overgrown with box trees, acacia, and black wattle, our pilot turned in a N.N.W. direction, following a chain of claypans and flooded polygonum and saltbush flats between two sandridges. At twelve and a half miles we arrived at a small sandy creek, forming the extreme head of the flooded flats. The natives appear to have sunk small shallow wells all along this creek, which is only two or three miles long, and is formed by the drainage from several small claypans; the black boy declared all these wells, with the exception of one, to be salt—the exception, which he called Pooliadonna, contained plenty of good water; we therefore camped here, near a few low green acacia bushes, the only timber in this region. After cleaning the well out, and sinking it several feet deeper, we came to liquid mud. By daybreak next morning we only managed to get five buckets, or about twelve gallons of water, which we put into the kegs. This well is a complete failure; a high sandridge, about one mile to the north-east of the well, is called Minkakunna. The country passed over to-day consists of white sandridges, most of which are very high and steep, with flooded flats and sandy valleys in between; no timber or trees of any kind are visible; the sandridges are partly covered with cane grass, and the valleys with cane grass, polygonum, a few patches of saltbush and cottonbush, and also a few minute tufts of inferior grass. I find this well to be in south latitude $27^{\circ} 12' 0''$. I had every intention of making a start to the north from here, but as the camels have had no water for several days, and as we have only about twenty gallons in our kegs, I must find another water of some kind before I venture to make a start into the dry country ahead. Moses, also, seems to dislike the country to the northward, and tried to persuade me to leave it alone; he declared it to be all salt lakes and sandridges, and as a further inducement he pointed north-east, and offered to show me a well in this direction, which he called "Mickery Pompomponali."

Saturday, 18th.—We left Pooliadinna Well, about 8·30 a.m. Moses, the black boy, again acting as our pilot. I have decided to try this new well of his, M. Pompomponah; our general course was about north-east, though often we deviated several miles to the north, and then again to the south. We first ascended the high sandhill Minkakunna, from whence an extensive view all round was obtained, revealing nothing but barren sandridges. At about two miles we came to a small waterhole, in the bottom of which the natives have been scratching for water. Moses now seemed perplexed, and turned and twisted about in every conceivable direction excepting westward. He led the camels over innumerable high and very steep sandridges, which we were thus compelled to cross at right-angles, and which proved very distressing to our camels. At about eleven and a half miles we crossed several dry swamps fringed with box trees. Moses now seemed utterly lost, and appeared quite undecided which way to turn. At twelve and a half miles we sunk several holes in a small swamp watercourse without getting any sign of water, and at last, upon questioning Moses where the well was, he said he did not know, and that he had not seen it or been in this country since he was a little boy. I now proceeded in a N.N.W. direction, across a flooded flat, to a small waterhole whose position I guessed from the plans in the Surveyor-General's office. At three and three-quarter miles we arrived at the waterhole, which is caused by a break in a sandridge; it is almost circular, and about thirty yards in diameter, and from six to eight feet deep when full; at present it only contains about an inch of liquid and putrid mud, with which, however, we were glad to fill our casks; it has a most vile taste, and caused us all to vomit violently.

Sunday, 19th.—I proceeded early this morning in an easterly direction, passing a trigonometrical station (Minna Hill) on a low sandridge. The pile of wood forming the landmark has been blown down and entirely destroyed. I searched amongst several clumps and belts of box timber; found several small waterholes and one native well; all were, however, quite dry. Returned to camp and directed the men to sink a well alongside the waterhole, which the natives called Matamurna and Murdamaroo. At about nine feet, through soft mud, clay, and sand, we struck a fair supply of slightly bitter and salt water, which was, however, infinitely preferable to the putrid mud in the waterhole. I have called this well Warman's Well, after my camel-man.

Monday, 20th.—It commenced to rain in very light showers in the early part of the night, and continued nearly all day; the rain, however, was not sufficiently heavy to leave any water about, and only prevented us from making a start; we therefore employed ourselves in baling out the well, filling the watercasks, and watering the camels, which occupied us until late at night.

Tuesday, 21st.—This morning Moses was started after the camels, about 4 a.m.; he, however, did not return for several hours, and I suspected, what I soon found to be the case, that he had deserted us. I believe he was afraid to venture into the country to the north; we made a very late start in consequence, and travelled all day in a north-north-west direction, the first six miles being over a flooded polygonum flat; we then proceeded another six miles over a fine hard cottonbush and saltbush flat, between two cane-grass sandridges. At twelve miles we ascended a very high and prominent sandhill, well adapted for a trigonometrical station. We now travelled over high cane-grass sandhills. At about fifteen miles passed to the west of a chain of small lakes; at twenty-two miles, near sundown, we camped (No. 4 camp) under a very prominent sandy point, which will also make a splendid trig. station. The view from here, although very extensive, is similar to that obtained at the last high sandhill. With the exception of a few white salt lakes, which are visible from west round by north to south-east, and only a few miles distant, nothing but dreary-looking cane-grass sandridges, devoid of timber or even the lowest bushes, are to be seen as far as the eye can reach in every direction. Obtained a set of observations, from which I deduced the latitude, &c.

Wednesday, 22nd.—No. 4 camp. We were up and after the camels before 5 a.m. this morning, but did not get a start from the camp before 8·45 a.m. We then travelled in a north-west direction, crossing several high and steep sandridges, and at about two miles we crossed a salt lake, which was just firm enough to allow the camels to walk across it, although in several places the hard salt crust or surface was broken through. At eight and a half miles we crossed another rather narrow but long salt lake; this lake extends a considerable distance to the north and south of our track, and contains many large fragments of selanite, which are also found on many flats between the sandridges. At from sixteen to twenty-three miles crossed a third and very large lake, which seems to extend to the horizon towards the south, even when viewing it from a high sandhill near its western shore. I have called this feature Lake Dobbie. At twenty-four miles we camped (No. 5 camp) sometime after sundown; ascended a high sandhill to the west of the camp, but could obtain no view or bearing, it being already too dark to see. Observed for latitude. The sandhills or ridges passed over to-day are similar to those previously described; a few small flats in between them produced a little old and withered grass, cottonbush, saltbush, and bluebush. We also saw a few low wattle bushes to-day. The salt lakes seem to increase in number, and apparently extend some distance to the north.

Thursday 23rd.—No. 5 camp. It took us fully an hour to pack up, the watercasks and other loading being so cumbersome and unwieldy. Our general direction was still N.N.W., over cane-grass sandhills (most of which are rather high and steep) and fine hard flats overgrown with low bushes and a few patches of grass. At about five miles we crossed a fair sized salt lake; we very nearly succeeded in getting all our camels bogged here. At six and a half miles ascended a high and very conspicuous sandhill, from which a very extensive view was obtained. A small salt lake is visible to the west, a few miles distant, besides those we have recently crossed. Barren cane-grass sandridges, some of them very high, seem to extend for many miles in all directions. After taking a round of bearings, we travelled for ten and a half miles, across well-grassed flats and high cane-grass sandridges, to another high sandridge. At twenty-one miles we camped, it being sundown (No. 6 camp), amongst some gidea timber, which has become abundant in the valleys between the sandridges in the last few miles. Observed for latitude, &c.

Friday 24th.—No. 6 camp. Started after the camels at 4 a.m., commenced packing up at 5 a.m., and left the camp about 7 a.m. The camels appear to be very thirsty and have sulked all night; they look very hollow this morning, as usual when they are unable to obtain any water; they appear to require it. At the last waterhole they refused to drink, and we could only give them a partial drink at Warman's Well. Continued on yesterday's course nearly N.N.W., over low broken sandhills covered with gidea trees and cane-grass—a most wretched country for the camels to travel over, considering that the pack camels are carrying over 700lbs. each. At three miles we crossed a small salt lake; the valleys now become thickly timbered with gidea; the sandridges are still, however, quite bare. At thirteen and a half miles ascended a very high and prominent sandhill, for which I have been steering all day. I here saw the first plot of spinifex. A large and intensely white salt lake is visible to the south-west. A very extended view is obtained from

this sandridge, which would also make an important trigonometrical station; barren sandridges are visible and extend to the distant horizon in all directions. On plotting up my track roughly in my fieldbook, I obtained a bearing of $34^{\circ} 30'$ to the point or intersection of the Queensland and other boundaries. Started on this bearing over heavy sandhills. At one and a half miles I hit exactly on the corner post, which is almost in the middle of a long narrow salt lake. The line has been well surveyed; the corner is represented by a substantial gum post, about four feet six inches high, with three facings of about eight or nine inches wide, strengthened by two supports, and surrounded by a small earth mound; two long trenches, one extending north, and the other east, also serve to mark this important point, which is visible from the high sandridge previously mentioned. A splendid connection with the trigonometrical survey of the colony can thus be established. The corner post has been well marked with "Queensland" towards the N.E., "Northern Territory" on the N.W. side, and "South Australia, long. 138° lat. 26° var. $3^{\circ} 32' E.$ " on the south side. After taking notes we continued in a N.N.W. direction along the bed of the salt lake. At about six miles the lake terminates. A curious fact, which I could not help noticing from the first, is, that all these salt lakes have an extremely high and very steep sandridge invariably abutting on their western side, whilst the country near the eastern shore consists of low sandhills or flats. At seven and a half miles another very narrow salt lake commences, with the usual steep sandridge. On the western side, at nine and a half miles, we camped, long past sundown. The camels are very leg-weary, and appear to be desperately thirsty.

Saturday, 25th.—No. 7 camp. The camels, however, managed to stray away about six miles during the night, looking for water, I suppose, which prevented us from getting an early start. It is now about eleven days since they have had a good drink. We got under weigh about 8.30 a.m., and continued on yesterday's bearing, across a narrow salt lake and gidea flats, for six miles. At seven and three-quarter miles arrived at the top of a high and prominent sandridge; spinifex now takes the place of cane grass. On the sandridges low bushes, principally wattle, acacia, gidea, and an inferior kind of mulga also become abundant; the sandridges have also completely changed their color, for some days past, from white to red. Continued our journey in a northerly direction, over low jumbled spinifex sandhills, for eleven and a half miles, to the top of a high bare red sandhill. This hill, like all those I have mentioned previously, will in future form trigonometrical stations. I now change the course to N.N.W. At about three miles camped (No. 8) several hours after sundown. Our camels are completely done up. I am not at all surprised; no other living animal could travel over such a stretch of barren sandridges as we have come over during the last week or two. I find this, No. 8 camp, to be in latitude $25^{\circ} 33' 46''$ south, and long. $137^{\circ} 54' 0''$ east.

Sunday, 26th.—The camels made a determined effort to get away last night without stopping to feed; they made straight away to the N.E., and we could not catch them before they had gone six or seven miles. We started from this camp about 10 a.m., our course being about N.N.W. over high red spinifex sandridges and sandy valleys fairly grassed. At seven and three-quarter miles ascended a high and prominent sandridge. At sixteen and three-quarter miles we arrived at the top of another very high and conspicuous spinifex sandhill. I now altered the course to N.N.E. At one and a half miles camped (No. 9), completely tired out. Latitude of this camp $25^{\circ} 19' 36''$ south.

Monday, 27th.—I was determined to make an early start this morning; we therefore watched the camels by turns all night; they did not feed, being too much in want of water. We left camp at 7 a.m. on a N.N.E. course, over jumbled spinifex sandridges and sandy valleys. This country is very bad for camels to travel over; the wind has blown the sand into innumerable little hillocks or mounds, over which the camels are constantly stumbling, and, being unable to get a foothold on the slippery spinifex, they now and again have a heavy fall. Wattle, hop, and other bushes are getting abundant, also patches of grass. At about nine and a half miles arrived at the top of a high and conspicuous sandhill. We now continue to travel on various bearings until sundown, when we camped (No. 10 camp). The camels are very tired, and can only be knocked along at about two miles an hour. We have no proper riding camels; all those we have are pack camels and exceedingly rough to ride, far worse than a knocked-up cart colt.

Tuesday, 28th.—No. 10 camp. One of our camels refused to stand up this morning; we gave him a little water out of our kegs and a rest before we started. Our course being almost due east we travelled all day and part of the night at a very slow pace, averaging about one and a half miles an hour. We are now compelled to cross the spinifex sandridges, which are very high and steep and about a quarter of a mile apart at right angles; the camels always lie down as soon as they come to a sandhill, and generally require a good deal of persuasion before we can induce them to cross over; occasionally too, when descending a steep ridge, they pitch their loads, saddle and all, over their heads. Our No. 11 camp is in latitude $24^{\circ} 59' 7''$ S. The weather is now intensely hot: the camels were watched all night.

Wednesday, 29th.—No. 11 camp. Started before daylight on an east by north course. We travelled all day, and until late at night, over very high sandridges, the camels as usual lying down at every one. Camped about 9 p.m. (No. 12), latitude $24^{\circ} 56' 45''$. The sandridges passed over during the last few days are similar to those previously described. This country is a perfect desert, and I am afraid will never be of much use to the squatter. I am almost certain that this country has never been visited by natives.

Thursday, 30th.—We left camp No. 12 before 6 a.m., and continued to cross high and heavy cane-grass sandridges at a most awkward angle until we struck the Mulligan River at the most westerly bend, and near a fine large and permanent waterhole; we soon formed our No. 13 camp, which is in latitude $24^{\circ} 57' 35''$ S.

Friday, 31st.—I rested here to-day in lieu of last Sunday. The weather is now very hot; the flies during the day and the mosquitos at night are a great nuisance; we can, however, put up with these inconveniences now that we have plenty of water. I commenced preparing my plans, diary, &c., and also took a series of observations to determine the exact position of our camp. I shall have to stay here to-morrow, both to complete my work and also to give the camels a chance to regain their condition after having been eleven days without water, during which time they have traversed 205 miles of the heaviest and worst sandhill country in Australia; in reality they have been sixteen days, and travelled 278 miles, without a drink, as they would not touch the putrid mud and water at Warman's Well (Murdamaroo).

Saturday, September 1st.—I finished my plans roughly, only having a small theodolite box to work on; the waterkegs were also filled and all necessary preparations completed for an early start to-morrow. The waterhole is teeming with fish, and, although we are well provided with good fishing tackle, we are unable to catch a single fish. Game, such as native companions (flamingoes), emus, dingos, several kinds of pigeons and numerous other birds are also very abundant, and very careful to keep out of reach of our fowling pieec.

Sunday, 2nd.—This camp is the worst place for burs imaginable; all sizes and varieties are found here; some are as big as a small egg, and others again are just small enough to escape detection until you turn into your blankets at night, when you are soon made aware of their presence. We started from here at about 7·30, on a N.N.W. course, over spinifex and cane-grass sandridges and fine hard flats; the latter are well grassed and covered with an abundance of splendid herbage. Rain must have fallen here quite recently to cause these plants to spring up in such abundance. At ten miles or less, however, all these fine flats and succulent plants disappear, and nothing is seen but high spinifex, a few tufts of cane grass which generally grow on the top of the sandridges, and low bushes such as wattle, gidea, grevillea, poplar, and a few stunted inferior mulga. This kind of country continued until we camped at about thirty miles. I am very ill, and could scarcely sit on my camel during the day.

Monday 3rd.—I started about 7·30, on a N.N.W. bearing. I am still scarcely able to sit on my camel, but we cannot possibly camp here in the midst of these horrible sandridges. At four miles we altered our course to N.N.E. During the first few miles we crossed high spinifex sandridges and sandy valleys densely overgrown with spinifex; we then crossed numerous flooded box flats and low spinifex sandridges for about six miles, which then again change into high spinifex sandridges and sandy valleys; the latter contains a fair quantity of low bushes, such as gidea, wattle, grevillea, &c. We continued to travel over this wretched country until about three hours after sundown, when, having come twenty-seven miles, we camped. Observed for latitude, &c., which occupied me until 2 a.m.

Tuesday, 4th.—Made a fresh start this morning about 7 a.m. I have just had two hours' sleep; we travelled all day and until long after sundown in a N.N.E. direction: many stoppages occurred during the day owing to the camels breaking their nose ropes and shifting their loads in crossing the sandridges. We camped at twenty-one miles. The country passed over to-day consists of nothing but high sandridges and spinifex, with a few low bushes such as wattle and different kinds of acacia; towards the end of our stage, however, or in the last few miles, the sandy valleys change into fine hard flats, thinly covered with small pebbles of quartz, cornelian, and different kinds of porphyry: these flats are splendidly grassed and nicely covered clumps of gidea and isolated bloodwood trees which would make splendid material for huts and stockyards. The latitude of this camp is $23^{\circ} 59' 56''$.

Wednesday, 5th.—We started early, our intention being to make Sandringham Station before sunset; in this, however, we were disappointed through no fault of ours. We continued on a N.N.E. course, across high spinifex sandridges and fine hard and splendidly-grassed flats. At about five miles, on reaching the top of a high sandridge, we found a few small stony bare mounds stretching across our course. These hillocks are composed of a kind of conglomerate rock, now rapidly decomposing through denudation. The flats or gullies between the mounds are thickly timbered with gidea. At about six miles we crossed a portion of the Mulligan River in the shape of a salt claypan or lake, which was extremely boggy; the camels only just managed to struggle through, leaving tracks and holes in the lake which will be visible for years to come. We now crossed a gidea flat, well grassed with numerous tufts of Mitchell grass, cottonbush, salt-bush, and other salsolaceous plants. At about ten miles we ascended a high sandridge which occupies the exact position in which Sandringham Station is marked on the plans. No station is visible; we therefore continued westward for six miles, across high spinifex sandridges and well-grassed gidea flats, in hopes of again crossing the Mulligan River, but no creek channel is observable in any direction. Continued in a south-easterly direction; at two and half miles passed a small salt lagoon; the station people have been gathering salt here some time ago. We now followed an old buggy track to a point where we had previously crossed it, then, having come twenty-three miles, we camped at the intersection of all the different tracks, everyone well pleased at the prospect of making the station to-morrow.

Thursday, 6th.—Started early this morning, still following the old buggy track across the gidea flat previously mentioned. At about two miles crossed a few low spinifex sandridges, and shortly afterwards came to a flooded Mitchell-grass and samphire flat; a fine large waterhole is observable to the south, about a mile distant; we however did not examine it, but continued to travel to the eastward. At five miles we struck fresh dray tracks. At seven miles, the last two miles across a heavily-flooded flat densely overgrown with samphire, mint, polygonum, and other water plants, we arrived at Sandringham Station, which is situated near Bindiaacka Waterhole in Sylvester Creek, near its junction with the Mulligan River. A large mob of natives were camped here; most of them, however, seemed terribly afraid of our camels and would not approach us, preferring the stockyards as a safe retreat; after a time several boys, who apparently belong to the station, came to our camp and informed us that all the white people were absent from the station. Towards evening Mr. Barrington arrived, and treated us with extreme kindness and in a most hospitable manner. Mr. Ridley Williams and several other Queensland gentlemen also arrived at the station from the Herbert River; they are endeavoring to take 2,000 head of cattle across country to the telegraph line, to form a cattle station at Barrows Creek, for Messrs. Wooldridge, Murray, & Spence.

Friday, 7th.—We were busily employed in sorting and arranging our rations and other equipage for an early start into the country to the westward; my plans occupied me most of the day. I find, after carefully taking a series of observations, that Sandringham Station is shown nine miles out of position on the Government plans.

Monday, 10th.—Mr. Field arrived at the station this afternoon. I received a great deal of very valuable information from him, and also made my final preparations for a fresh start. I fully expected to be joined here either by Mr. Hay or his manager with horses; but I find that the latter has been here several weeks ago—in fact, before I left Adelaide—and after getting tired of waiting he returned to Palparara for fresh instructions from Mr. Hay, taking all the horses back with him. To avoid any further delay I shall complete the work with the camels alone.

Tuesday, 11th.—We managed to get a start from Sandringham Station, or Bindiaacka as the natives call it, by about 7 a.m. I have a black boy, who has been named "Blucher," mounted before me on my camel; he has expressed his willingness to act as our pilot into the country to the westward; but as he cannot speak a word of English, and moreover his only knowledge of the country consists in what has been told him by other natives, I presume he will not be a very valuable acquisition to the party. We effected a start after some little difficulty. I had to hold our pilot at first to prevent him from breaking his neck, as my camel decidedly objected to carry a double load; our course was about S.W. by S., across flooded flats covered with samphire and herbage. At seven miles we finally saw the last of the floodmarks of the Mulligan River, which has no defined channel here, and is only a succession of wide flats subject to heavy inundations. At nine miles we again entered the spinifex sandridges. At eleven miles we passed a claypan full of water,

which

which the natives call Boboreta. At thirteen miles we arrived at the Biparee Springs. These springs are situated at the north end of a small claypan, which is surrounded by high spinifex sandridges. A few natives were encamped here, who, however, on our appearance, fled into the sandhills; the springs, three in number, are close together and similar to a great many mound springs on the overland telegraph line; they are slightly above the level of the claypan on little mounds; the water, although somewhat charged with soda, is drinkable. One of these springs has been fenced in and cleaned out, which has caused a small stream of water to flow into the claypan. I found it to run about 2,000 gallons a day; a far larger quantity of water could be obtained by further improving the spring. From Biparee Springs our course was about west for nine miles, over very high and steep spinifex sandridges to another small claypan, which also contains three small mound springs similar to those at Biparee; they are at present useless, being choaked up with rubbish. It would require but a little labor to render these springs capable of watering a large quantity of stock. We camped at these springs, which the natives call Booleoora. Another small claypan, containing several springs similar to Booleoora, and situated about half a mile to the N.W., amongst the sandhills, is called Tintagurra. I examined the country for several miles to the north and north-east, and at sundown returned to camp and took a series of observations to determine the correct position of these springs.

Wednesday, 12th.—A fearful hurricane, driving clouds of dust and sand into our faces has been blowing from the west for the last forty-eight hours, rendering travelling across these sandridges anything but pleasant. We managed to get a start from Booleoora Springs by about 7 a.m., our course being very irregular and subject to many abrupt turnings. Our pilot, Blueher, at last declared that he was lost. I therefore mounted him on another camel and again assumed the lead. We passed Tintagurra Springs, and another small spring at about one and a half miles; this last spring seems to be a favorite camping place for the natives; probably the water is slightly better than that in the other springs. The valleys in between the sandridges are now again covered with gidea. At four and a quarter miles we passed Montherida Spring. I now turned south, and at three quarters of a mile pulled up at a small spring which the natives call Alnagatar. We filled our kegs here in case this should be our last water. On ascending a high sandridge, to the east of Alnagatar Spring, I saw another small spring which the natives call Cunja. All these springs are similar, and are situated in small claypans amongst high red sandhills; they could be made to water a large number of stock if properly developed. From Alnagatar we pursued a N.N.W. course for four miles; thence west by north for another eleven and a half miles, across a hideous spinifex desert, consisting of very high and steep red sandridges and narrow sandy valleys. Towards the end of our stage we passed a few gum flats; the tops of the sandridges are covered with low bushes, such as grevillea, several kinds of wattle, the pituri bush in great profusion, low mallee and native poplar; the Haek pea is also very abundant; also a low bush belonging to the sensitive order (*Neptunia*), which seldom expands its leaves. We camped amongst the spinifex when too dark to travel any longer. Our routine is as follows: We generally turn out of our blankets and prepare for a start about 4 a.m., never later than 5. The camels are then brought in, and breakfast and packing up is taken in hand together, both being finished generally by about 7 a.m.; we then make a start and travel all day at a slow and very tedious pace. At sundown, and very often later, a place for a camp is selected; the camels are then unloaded and hopped out, the saddles examined, and if necessary repaired every night; and, finally, observations are taken for the purpose of checking and correcting the position of the camp, diary written, and plan roughly plotted up. At between 11 and 12 p.m. everything is finished, and we again turn in to sleep until 4 o'clock next morning; the latitude of our present camp is $23^{\circ} 59' 27''$.

Thursday, 13th.—A start at about the usual time was made this morning, on a westerly course, across the usual high spinifex sandridges. At about six miles we crossed a creek (Apinga) which is merely a flooded flat about a quarter of a mile wide, between two sandridges; the flat is thickly covered with rank grass and stunted gum and box or coolibah, the only grass and timber within miles of this spot. I now altered the course to N.N.W. At about two miles we again entered the Northern Territory of South Australia. We continued to follow the creek up for about seventeen miles, crossing on to the eastern side and camping at sundown. The creek, which is about half a mile wide, still retains its flat appearance; it is overgrown with rank grass and also a few rushes, and thickly timbered with bloodwood and stunted gum, which, however, is gradually decreasing in size; the floods have also washed out several small channels amongst the timber. The country thus far on each side of the creek consists of a miserable spinifex desert; the soil has changed considerably since leaving the Mulligan flats; it now consists of a loose red sand mixed with particles of clay. This combination is very porous, and very seldom (never in my experience) holds a permanent waterhole. The latitude of our camp is $23^{\circ} 45' 25''$ S.

Friday, 14th.—A start was made after the camels at 4.15 a.m. At 7 we left the camp and then spent several hours in searching the creek for water and in tracking a native whose tracks we found last night. We very soon overtook a lubra, and shortly afterwards saw her husband or companion perched in a tree. We made signs to him and he soon joined us; the only article of clothing these two natives possessed being a part of an old red kerchief, which the lubra had tied across her breast; very soon this became irksome, and she discarded this her only article of dress. Also our black boy had a long conversation with them, which being finished we all started up the creek in a N.N.W. direction across spinifex sandridges. At three miles we arrived at the top of a rather high rocky sandstone ridge, from which we obtained an extensive view; low table-top hills are visible towards the N.W. and N.E. After crossing to the north side of the ridge we arrived at a box and polygonum swamp, which our friends the natives called "Woonunajilla." Large but very shallow sheets of water were visible amongst the box timber, a most pleasing sight after the wretched dry sandridges. After resting a few minutes, during which we tried to shoot some ducks—there appeared to be thousands, yet we did not obtain one—we continued on our former course, over low spinifex sandridges for about six miles further, to the top of another sandstone ridge. Our black friends now urgently desired to ride with us on our camels. A very extensive view is obtained from this last stony ridge; low table-top hills are visible from west round by north to east. Blucher, our black boy, informed me that the creek which we were following up came through a gap in a distant range bearing about N.N.W.; this will therefore be our future course. We had some difficulty to find a way for the camels down the north side of the sandstone ridge; after various attempts we succeeded at some risk in getting them safely down. The country now changes into fine hard flats, beautifully timbered with gum, acacia, and a few mulga, and splendidly grassed, good herbage, including saltbush, being very abundant; it seemed to us like travelling through a garden after our late experience amongst the sandridges. At sundown we arrived at a small waterhole which the natives call "Walcataman"; it contains about two feet of rainwater. We camped here. The observed latitude

latitude was $23^{\circ} 27' 57''$; this waterhole, which is situated in a branch creek on the west side of the main creek, is about 150 yards long, forty yards wide, and from four to ten feet deep when full. The banks are formed of red porous soil.

Saturday, 15th.—We left Walcataman Waterhole at 7 a.m., on our previous bearing; at one and a half miles we passed another waterhole which our black friends called "Tinnargee"; it is about the same size as Walcataman, and contains about the same quantity of water at present. A large number of pigeons, parrots, cockatoos, and other birds come here to water; we managed to shoot enough to make a stew. After travelling about eleven miles across the same kind of country we passed over yesterday afternoon, we arrived at another waterhole which the lubra called "Mircirrow." It seemed to surprise our sable friends very much to find it quite dry. Its dimensions are sixty yards long, fifteen yards wide, and eighteen feet deep. The creek now splits up into numerous wide clay channels, which seem to carry off an immense volume of water at times, judging by the floodmarks. Dark scrubby ranges are visible a few miles distant on both sides of the creek; they are rather high in places, and covered with mulga scrub. Granite is the chief formation, which is a sign that no springs exist in this neighborhood. I now altered the course to magnetic north, following the creek, which is here a network of clay watercourses; fine green herbage is very abundant and grows to an extraordinary size. At seven miles we arrived at another and rather large waterhole, called "Wonnadinna." We found about thirty natives camped here; most of them made off to the ranges on our approaching their camp; a few of the men, however, came up to us; they seemed quite at home with the camels, and not the least afraid of anything they saw. This waterhole is about 200 yards long, thirty yards wide, and about sixteen feet deep; it contains about four feet of water at present. The blacks spoke of another water a short distance up the creek, which they called "Mur-pronga." Upon my intimating that I wished to see it, they all started up the creek, carrying a number of emus, which they had just killed and cooked, on their heads. At one and a half miles we all arrived at a small puddle of water in a deep clay channel. A second lot of natives were camped here; they however all fled into the ranges. We passed their camp and continued up the creek. Our former friends here left us and remained at the native camps. At two and a half miles the ranges close up and approach the creek on both sides; just beyond we arrived at a large waterhole which the natives call "Alanajeer." This appears to be the principal waterhole in this creek; it is about 400 yards long, twenty yards wide, and from ten to twenty-five feet deep; the banks, however, are composed of red soil, which allows the water to soak away very rapidly. At present the water extends along the creek for some distance, probably for a mile and a half, including numerous breaks; it is, however, very shallow. Alanajeer proper contains about five feet of water in the deepest part, and will last perhaps four months longer; it is by no means permanent, but water could be obtained here for fully twelve months after rain, either on the surface or by scratching in the sand. The country in the immediate vicinity of the creek is splendidly grassed. Mitchell and various other grasses as well as good herbage is very abundant, and also those bushes which cattle prefer. Scrubby ranges of some elevation are visible in all directions: those towards the west appear to be the highest. I have called these ranges the "Adam Ranges," after Mr. Adam Hay, of Queensland. They extend a considerable distance to the westward; the flats between the ranges are beautifully timbered with fine large bloodwood and gum; mulga and gidgea or myall are also plentiful. We camped at Alanajeer, the latitude of which is $23^{\circ} 11' 17''$.

Sunday, 16th.—I was fully employed in plotting up my sketchings and bringing the diary up to date; the waterkegs also required cleaning out, as they have become very foul. I also marked a large box tree on the west side of the waterhole $\frac{C.W.}{23}$, this being my twenty-third camp since leaving Cowarie.

Monday, 17th.—A start was made after the camels at 4.10 a.m. We left Alanajeer Waterhole about 7 a.m.; our course was a little north of west towards the point of a range. We travelled over magnificently grassed flats, openly timbered with fine large gums, gidgea, and grevillea. At two miles we crossed several branch creeks of the Field River. These creeks run through a gap in the ranges to the south, and eventually form a junction with the main channel several miles south of Alanajeer. At a little over five miles we arrived at a point of the range from which an extensive view was obtained towards the N.E., in which direction many detached flat-top hills and bluffs were visible. We now proceeded up a wide valley with high scrubby ranges on both sides; at ten miles we arrived at a very high and prominent hill; it is by far the highest point we have yet visited. To the west of the Field River, a very extended view revealed numerous flat-top, round, and pointed hills; towards S.W. the country however appears very level; the distant horizon towards the west, and a little to the north of it, is broken by a succession of peaks: they appear to be very distant. We continued on a westerly course, leaving the ranges behind and to the north. In a few miles we entered a well-grassed mulga and boxwood scrub, which, however, very soon changed into the usual desert country, consisting of red sand covered with spinifex, low mallee and wattle bushes, and a few bloodwood and grevillea trees. At about twenty-four miles we camped between two low stony hills. I obtained a good view from the western hill in the early morning; the high hill previously mentioned bears exactly east. Another very prominent mount is visible to the E.S.E. Very low stony rises extend in all directions. Towards the north and west the horizon is occupied with innumerable detached table-top hills. The country in the immediate vicinity of these hills has been recently burnt, and presents for miles a very red and glaring appearance. Our black boy, Blucher, is very ill; he has been crying like a child nearly all day. Observed for latitude during the night.

Tuesday, 18th.—This morning Blucher appeared to be seriously ill and quite unable to move. The jolting of the camel seems to have shaken his inside to pieces. We left the camp about 6.30 a.m., still following a westerly course over desert country. I am anxious to find some water so that I may be able to give Blucher some rest and a chance of recovering, which I must admit to be extremely doubtful. He is very fainthearted, and has fully made up his mind to die; he is also very anxious for me to return to Bindiacka or Sandringham Station. At about sixteen and a half miles we again crossed the Adam Ranges, and ascended a high hill for which I have been steering since yesterday; the hill is wedge-shaped and capped with an immense block of red granite, which is plainly visible for a long distance; this hill forms the highest point of the ranges in this neighborhood; it is principally composed of granite, hornblende, mica, quartz, and other rocks crop out in places. I have named this hill Mount Tietkens, after Mr. W. H. Tietkens, F.R.G.S., the well-known Western Australian explorer. Another high hill, standing apart and forming the southwestern extremity of these ranges, I have named Mount Smith, after Mr. A. Smith, of Adelaide. I altered our bearing to west by south, passing a high hill (Mount Smith) at five miles. This hill is very conspicuous; it is almost circular, and composed of granite, capped with ironstone, which gives it a black appearance from a distance. Isolated hills are visible towards the north, east, and south; towards the west the country

appears

appears quite level, and consists of sand, spinifex, and low scrub. A few very small grassy flats are to be seen around the bases of the last two hills, otherwise the country is nothing but a hideous desert. Again altered our bearing to west; at about three miles we crossed a wide sandy creek, which I have named the Hay River, after Adam Hay, Esq., of Palparara Station, Queensland. Camped on the western side of the creek. Sent one man down the creek to examine some native wells; he returned after sundown and reported having found plenty of water in them. Observed for latitude and prepared for an early start in the morning.

Wednesday, 19th.—As usual, when I am desirous of making an early start, some unthought of incident is sure to occur to cause delay; in this instance the camels were not found until late, and I did not get a start until 6 a.m. I only took one man and two camels with me, my object being to form a connection with my previous explorations. I cannot in any case move camp for a few days on account of the black boy's illness; he is almost dead, and one more day's jolting on a camel would finish him at once. Our course was almost due north, along the western side of the Hay River. At two miles we crossed the creek and continued over red sandy country covered with spinifex and low mallee bushes; at about seven miles we ascended a low stony hill; from here we obtained an extensive view all round. Detached table-top hills, many apparently of some elevation, are visible to the north and east. The Tarlton Range (of my previous exploration) bears about N.N.E. from here, and is only about eleven miles distant. Far away to the westward a high mountain is visible above some low table-top hills; this mount is near the Jervois Range, and presents a magnificent sight even at this distance, reaching apparently to the clouds. I have named it Mount Cornish, after Mr. H. Cornish, the surveyor and explorer. The country in this direction, and to the south-west and south, appears to be a perfectly level scrub, which extends to the horizon. I now altered the course to N.W. by N., towards some low peaked hills on the south-western end of the Tarlton Range. After travelling across spinifex country for thirteen miles, we ascended the most northern peak, which proved to be very steep and rugged. The Tarlton Range, a high scrubby tableland, shuts out the view to the eastward; towards the south and westward the Hay and Marshall Rivers (of my previous explorations) are easily traced; they form a junction a few miles S.W. from this hill; but the most conspicuous feature is the Jervois Range to the N.W.; it is visible for a long distance. To the westward and to the northward it terminates abruptly near a high mountain—the Central Mount Hawker of my former explorations. This mountain is exactly in the centre of all Australia, a spot which many explorers have vainly tried to discover, and which I have but too much reason to remember. It was here, in 1881, that I almost perished from thirst, and lost several valuable horses, which compelled me to walk over 300 miles through desert dry country, without any boots to protect my feet against the innumerable burs and spinifex grass which covers the whole of this country. I was suffering, moreover, at the time, from scurvy and rheumatic fever. The MacDonnell Ranges are far too distant to be visible from here at this time of the day. I continued to travel on the same course—that is, N.W. by N.—towards another peaked or pointed hill. The country now changes into beautiful grass (Mitchell) and salt-bush flats, nicely timbered with gidea and box timber. At about six miles we reached the hills, which turn out to be long narrow ridges capped with granite. The Tarlton Range now takes a sweep towards the eastward; it is here covered with fine Mitchell grass and clumps of gidea. Again altered bearing to north; at about three miles we passed to the westward of two very peculiar white hills, peaks, or pillars, which are situated on the top of a spur in the range. These hills, when viewed from a distance, have the appearance of white pillars; they are crowned by perpendicular Kaoline rocks. During my previous explorations I named them Goyder's Pillars, after G. W. Goyder, Esq., the Surveyor-General of South Australia. At about six miles altered our course to S.S.E., towards the range, which consist of nice grassy slopes. At five miles we arrived at the top of the range, and again changed our course to S.E., down a rocky gorge, densely timbered with mulga, gum, gidea, and other low bushes, through which we forced our way with great difficulty. At two miles we left the range behind us and entered an openly-timbered country, which is beautifully grassed. At three miles we camped amongst a clump of gidea timber; our stage to day has been a little over forty miles, to accomplish which we were compelled to keep our camels at a constant jog, which has nearly shaken us to pieces.

Thursday, 20th.—We started to look for the camels long before 4 a.m., but eventually had to wait for daylight in order to be able to track them, which turned out to be a most difficult proceeding; the brutes seem to have made off as soon as they were turned out last night, never stopping an instant to feed. After walking twenty-six miles we found them, and also ascertained the fact that we had no more water; we therefore lost no time, but packed up and started straight back for the main camp, which is some twenty-eight miles distant; we passed over some very rough hills, which, however, were well grassed. At ten miles we entered the sand and spinifex, and soon afterwards surprised two aborigines, a lame man, who was walking with the assistance of two spears, and a boy; the latter was half dead with fear, and unable to articulate a word; the former, however, behaved in a most curious manner. I found him lying flat on the ground, and dismounting close to him, turned round to look at the boy; on again turning towards my camel, I found he had taken possession of my seat; he seemed quite at home in the saddle, and when I approached he only shifted on to the front seat; he seemed determined to have a ride. I was, however, compelled to request him, by gestures, to dismount, which he perfectly comprehended; we left him hobbling away towards the creek. After proceeding two miles further, my camel, Rhesus, a cranky brute, lay down and refused to get up again; he became very furious, tearing the saddle and packbags into shreds with his teeth, in his endeavors to seize my legs. After trying all the usual methods, such as lighting a fire under his tail, &c., we at last dragged him along with the aid of our other camel; only one more mishap occurred. Before we arrived at the camp, whilst crossing the Hay River, my camel again threw himself against the bank of the creek with great violence. We finally reached camp about 9:30 p.m., thoroughly knocked up, having been without food and water the whole day. I found everything at the camp all right, and the black boy much improved, which pleased me most. A few niggers have been prowling around the camp during the day, but they did not venture to annoy us.

Friday, 21st.—Started at 6 a.m., and moved the camp down the creek as far as the native wells, which on being dug out were almost dry; we then sank trial wells for several miles down the creek without obtaining any water; this is the result of my placing any confidence in the men's reports. I purposely sent a man to examine these wells, and he reported them to contain plenty of water, which induced me to map the country without looking for water during my last trip. At 2 p.m. I sent the camels, together with the two men and black boy, up the creek, remaining behind myself to take care of the camp and rations. Several natives made their appearance near the camp about 4 p.m.; they however ran away as soon as they found themselves observed. I obtained a few gallons of water out of the well in the creek during the afternoon and

and night. At 2 o'clock in the morning one man returned and reported having examined the creek for eleven miles without finding water. Whilst returning with the camels a native well was found on the eastern side of the creek, about five miles from here, and another about two miles from here. The camels were left at the five-mile well. I directed him to return and fill the waterkegs, and if possible to bring half the camels into camp to-morrow.

Saturday 22nd.—About noon, one man and the black boy arrived with one set of kegs full of water, and four camels, the rest are still at the five-mile well. I left the black boy to mind the camp, and returned with Fowler to the well, two miles from here. After some trouble we dug out a large hole in the sand, about 8ft. long, 6ft. wide, and over 3ft. deep, to hard pipeclay and sand bottom; to accomplish this we had to shovel out an immense quantity of loose dry sand. The camels drank about forty gallons each, and it took until sundown to satisfy them all; the water drains into the well very slowly. Returned to camp after sundown, directing Fowler to bring the rest of the camels in as soon as they had received a drink. About 8 o'clock Warman arrived with the remaining camels, and shortly afterwards Fowler also returned.

Sunday, 23rd.—Collected the water out of the wells in the creek for a final drink for the camels to-morrow morning. In the afternoon I proceeded to the westward for about eight miles, across red sandy country covered with spinifex and low mallee bushes; returned to camp, as I saw no appearance of a change of country ahead. Marked a large gum tree near these wells on the western side of the creek ^{c.w.}, this being my twenty-seventh camp.

Monday, 24th.—The camels were brought in early this morning, and we managed to get a start a little after 6. We continued to follow the Hay River down, which trends in a S.S.E. direction. At about two and a half miles I ascended one of two small stony rises on the western side of the Hay River. The Adam Ranges are visible towards the north and east; towards the S.E. a high hill is visible a few miles distant. The creek or river passes close to its western side. I have named this feature Mount Winnecke, after a relation. Towards the S.W. the country appears to be level, and to consist of spinifex and scrub. We continued our journey, passing close to Mount Winnecke, at six miles. At eleven miles, the country becomes slightly undulating, and a little further on changes into low sandridges which approach or rather run parallel with the creek on both sides. I thoroughly examined the latter, but only found one small dry native well near the mount. The creek has a wide sandy channel and red clay and sand bank from 3ft. to 8ft. high; it is splendidly timbered, containing many fine large gum trees, a great many measuring quite 4ft. in diameter. The creek is flanked on each side by narrow and well-grassed flats, which have at one time been flooded; these flats never appear to extend further than half a mile from the creek; occasionally, however, the everlasting spinifex forces its way up to the banks of the river. We camped about an hour after sundown, having travelled over thirty miles. Our camp is situated in the middle of the creek, the only place we could find at all free from those noxious burs which are a curse to this country. The creek near our camp has a white sandy channel from five to six chains wide, with many lateral clay channels, which, however, are quite useless as far as holding water is concerned; the soil, or clay, is too porous to hold water longer than a week. Our camels have been on very bad feed lately, and several of them were on the point of giving in to-day. The latitude of this camp is $23^{\circ} 30' 11''$.

Tuesday, 25th.—No. 28 camp. I left most of the camels to rest here to-day, whilst I was examining the country on both sides of the creek. One man was dispatched to the westward; on his return, he reported having travelled due west for eleven miles, over sandy country and very low sandridges covered with dense spinifex and a few low wattle and mallee bushes. I started at 6 a.m. on a N.E. course (50°) across similar country. At fourteen miles I altered my course to east (90°) for nine miles, then south (180°) for one and half miles; south-west (210°) for two miles; west by south (250°) for seventeen miles; and finally west for three miles back to camp. With the exception of about a mile near the creek, which is splendidly grassed, the whole of the country passed over to-day consists of low sandy undulations, sometimes assuming the appearance of low sandridges covered with high dense spinifex and openly timbered with desert grevillea, box, and low mallee and wattle bushes.

Wednesday, 26th.—This morning I found that the wild dogs, of which there are a large number here, have carried off one of my boots; this is a most unfortunate occurrence, as I have no substitute with me. We spent several hours searching around the camp to no purpose. I suppose I shall have to be content with one boot until I return to Sandringham Station. This could not have happened in a worse country. The ground, bushes, &c., are literally smothered with burs, from which our camels suffer severely; we started late in consequence. The natives with whom our black boy made friends and camped last night had previously cleared off, leaving all their utensils behind. We again followed the creek, which still trends in a S.S.E. direction; in a few miles numerous box and gum channels branch off, some running out into the sandridges, whilst others again join the main channel; at about nine miles from Yarracurra-coo (native well), the creek with its several channels is from two to four miles wide. The gum flats and those sandridges in between the different creek channels over which the floods have passed are splendidly grassed. Great quantities of dry Roli-Poli bushes have been blown into the creek and almost block up the main channel and flat, which is about half a mile wide; in many places the floods have washed entire sandridges away. At twenty-three miles we camped on a splendidly-grassed gum flat, about half a mile to the east of the main channel, which here is only recognisable by the floodmarks and a few deep ruts in the soil; the country a few miles to the east and west of the creek consists of high red sandridges, covered with dense spinifex and a little cane grass, and also a few low wattle and grevillea bushes. It turned out to be too cloudy to obtain any reliable observations.

Friday 28th.—No. 30 camp, Hay River. I left most of the camels here in charge of one man and the black boy, only taking the two fastest camels and one man. I started down the creek in a S.S.E. direction, at about 6 a.m. The creek now consists of numerous flooded flats several miles wide; these are densely timbered with large gums and box; it has no longer any defined channel. At eighteen miles I altered my course to S.W. (230°). After crossing the creek, I at once got into high red sandridges and sandy valleys, covered with spinifex, low grevillea, and wattle bushes. At twelve miles, seeing no apparent change of country ahead, I again altered my course to nearly east ($76^{\circ} 30'$) for thirteen miles to the eastern side of the Hay River, which now consists of only six flooded flats, divided or separated by high sandridges and densely timbered with gum and box. I again altered bearing to N.E. for three miles into spinifex sandridges, and there camped, it being too dark to see. Our stage to day is a little over forty-six miles, and the camels on being turned out at once lay down, being too tired to feed.

Saturday, 29th.—Camp No. 31. In the morning we found that they had scarcely moved, and we commenced to make preparations before 2 a.m., but had finally to wait until nearly 5 a.m. before it was sufficiently light to make a start. We then steered away towards the south, striking the river again at five miles, which we followed in a S.S.E. direction for six and a half miles, and then finally left it. I have previously crossed it at a point thirty-five miles south-east of here, amongst the sandridges, still trending away in a S.S.E. direction. Our course now was N.N.E. over high red sandridges covered with dense spinifex and a few low wattle and grevillea bushes. At nine and a half miles changed bearing to east (85°) for thirteen miles; thence N.N.W. for nine miles, and west for six miles, without meeting with any change of country; camped when too dark to travel any longer. Our camels appear very distressed and won't stand much more of this kind of work. Our stage to day has been forty-nine miles.

Sunday, 30th.—Camp No. 32. We left this camp at daybreak, our course being a little to the east of north across high and very steep red sandridges with the usual spinifex and burs, from which our camels suffer very much; a continual stream of blood is trickling down their hind legs. At sixteen miles, I altered our course to S.W. by W. for seventeen miles—desert spinifex country; thence due west for eleven miles, back to camp No. 30. I found everything there all right, the black boy alone being dissatisfied; he is very anxious to return to Bindiaeka, and is quite sick of this desert country.

Monday, October 1st.—Camp No. 30. Started the camels back to Yarraeurraceo Well this morning; they are to return on our out-going tracks. I took two camels and proceeded in a N.E. direction (30°), across the same kind of red sandridges so often described; at eleven miles altered my course to E.N.E. (65°) for seventeen and half miles; thence W.N.W. (295°) for eleven and a quarter miles; camped some time after sundown amongst high dense spinifex and red sandridges, a most discouraging country to travel over, and for which a man obtains little or no credit; and yet it is necessary to traverse and examine this country in detail, for one can never tell where and when an oasis may be found.

Tuesday, 2nd.—Camp No. 33. I started at daybreak, my camels having fed close to the camp all night, and made a straight course for the well, which bears about W. by S., at twenty and half miles, across desert spinifex country and sandridges. I landed right at the well; I soon formed a camp and re-dug the well, and also put up a secure rail fence around it to prevent the camels from injuring themselves. The natives have been here during our absence and carried away their valuables.

Wednesday, 3rd.—Leaving all those camels at the well which needed a rest, I took two of the pack-camels to ride; the brutes were very awkward and fearfully rough and slow; several times they attempted to pull us out of the saddle. We started in a north-west direction, traversing the usual sandhill country; we also crossed numerous claypans and hard flats between the sandridges: these were abundantly covered with small ironstone pebbles and fragments of brown slate, and splendidly grassed—Mitchell grass and saltbush growing in profusion in many places. We also met with a good deal of dense scrub, consisting of wattle bushes and mulga. At about thirteen miles we altered our course to west, and for ten miles travelled over open spinifex sandridges. I then again changed our course to S.W. for eleven miles, across similar country, and south for nine miles, to No. 34 camp. The last distance was across high and very steep red sandridges. It is very monotonous and dreary work to travel across this kind of desert country day after day. Our camels, on being let go, laid down and never moved until about 2 a.m.

Thursday, 4th.—They then apparently started to feed. We were after them at daybreak, and had to walk about seven miles before we overtook them; in consequence of this a very late start was made from No. 34 camp—course about 10° north of east for nearly eleven miles, across very high and steep spinifex sandridges; we then altered our course to east, across similar country. At eleven miles we passed a few miles to the north of a rather large salt lake, which I have named Lake Caroline. The country now undergoes a change; numerous stony claypans (some of which appear to hold water for a considerable time after rain) occur amongst the sandridges, which open out considerably, the intermediate space being occupied by fine hard flats, which are splendidly grassed—Mitchell and various other grasses and saltbush being very abundant. At seventeen miles we returned to camp (No. 29) at Yarracurraeoo Well, and made preparations for our final departure from this river, which has been of great service to us. Without it I should have had great difficulty in examining and mapping such a large space of desert country as I have been over in the last week or ten days; the well receives most of the drainage from the claypan flats on the west side of the river, thus very little rain would cause a large quantity of water to run into the creek and eventually drain into the well. We have made no impression on the water; in fact, it seems to drain in faster and more abundantly than when we first arrived here, and I think that water can always be obtained here for fully a twelve months after rain; the supply at present is about a thousand gallons per day. I have marked a tree on or near the eastern bank of the river with my initials and number of the camp, thus C.W.; the well is about six chains to the west of the marked tree, which no one riding near the eastern side of the creek can fail to notice.

Friday, 5th.—We started from here about 6 a.m. and pursued a north-easterly course the whole day; a strong north-westerly gale, blowing clouds of sand about, renders travelling anything but pleasant. For about two and a half miles from the well the country is fairly grassed; beyond that the high red sandridges and dense spinifex continue unbroken as far as the Field River to the eastward. We camped about an hour after sunset, having travelled about twenty-eight miles. Our camp is situated amongst very high spinifex, and we were compelled to remove a large patch before we could attempt to light a fire, the least spark from which would have resulted probably in the total destruction of the whole party; the north-west gale continued with unabated force throughout the night. During our journey to-day we set fire to the spinifex many miles from our present camp; the strong wind has caused the fire to assume vast proportions and to extend for miles towards the south. About 3 o'clock in the morning the whole heaven assumed a lurid appearance, and at one time presented a grand and magnificent sight, which we, however, did not fully appreciate; the fact that the fire might possibly take a sweep towards our camp or reach the camels considerably reduced our admiration.

Saturday, 6th.—We however got safely through the night and started after the camels at daybreak. These brutes when most wanted generally take a rambling fit. It was late before we obtained a final start; our course was about 11° east of north. At two miles we ascended a high sandridge near a remarkable single tree which is visible for many miles around. Some high and prominent hills are visible to the S.E., about seven miles distant. I have named the highest point "Mount Knuckey," after Mr. R. Knuckey, one of the well-known pioneers of the Overland Telegraph Line. Many detached hills of various shapes, some circular, but many more tent-shaped or table-topped, are visible towards the north; the highest hill bears about 355° or five degrees west of north, and is sixteen miles distant. I have named it Mount Dobbie, after

Mr. Thos. Dobbie, of Adelaide. I now altered our course to N.N.W., towards Wonnadinna Gap, in the Adam Ranges. We travelled across bare red sandridges and valleys which have been recently burned; the absence of spinifex is a great relief both to us as well as to the camels, who suffer dreadfully from the prickly points. The burnt country is fairly grassed, which will last until again destroyed by the encroaching spinifex. At fourteen miles we finally left the sandridges behind us and traversed a grassy flat with belts of gidea and gum. At twenty-four miles we arrived at the Field River, and at twenty-five miles passed Wonnadinna Waterhole, near which we observed several natives running towards the ranges. Our black boy now became very excited and desired to go after these runaways and bring them back; he tried several tricks to get away, and at last attempted to jump off the camel; however all his endeavors to escape were of no avail. At twenty-eight miles we arrived and camped at Alanajeer, our previous No. 23 camp. We prepared our camp in expectation of rain; there is every appearance of a thunder storm coming on. The hot wind continues to blow with increased force; the whole sky is overcast, and towards the east continuous flashes of heavy lightning are observable, followed by the distant rumble of thunder. The atmosphere is heavily charged with electricity. However, beyond a few light drops during the night, the rain-clouds passed on to some more favored region, and the weather still continues very sultry.

Sunday, 7th.—We had a few drops of rain next day; more seemed to be falling towards the south. I plotted up part of my work, which occupied me all day.

Monday, 8th.—Early this morning I took two camels and one man, and leaving the rest of the camels at this waterhole, I started up the creek, which I examined thoroughly; it is several miles wide and has numerous narrow channels with many small waterholes; many of these channels are well adapted for damming. The timber, which is very abundant, consists of fine straight gum, bloodwood, and gidea. This country is magnificently grassed; saltbush and other herbage is also very abundant. At nine miles we arrived at a small waterhole (dry), which the natives call Nummirra; it is about 150 yards long and nearly twenty yards wide and over six feet deep, with a flat rocky bottom. Altered our course to N.E. for three-quarters of a mile to top of low stony undulation; the spinifex has now completely disappeared and good grass is everywhere abundant; many flat-top hills and ranges are visible in all directions. We made a fresh start on a N.N.E. bearing, crossing flooded grassy flats densely timbered, the gum and bloodwood trees forming quite a forest. At two and three miles crossed the two principal channels of the Field River; the channels have a sandy bed and are about a chain wide, with steep banks from four to six feet high. We had great difficulty in getting up and down these banks; the camels being very weak, rolled back into the creek several times. At five miles we ascended a rather high and very rough granite and porphyritic hill; many table-top hills and ranges are visible from here towards the north; the country also appears to be very scrubby. At seven and a half miles we crossed a small tributary creek of the Field River, and at nine and three-quarter miles we arrived at the top of some low but well-grassed undulations. Part of the Cairn Range limits the view towards the north to about six miles. The Cairn Range consists of a long, low, and very scrubby, granite tableland. Continued our journey on a S.E. course, crossing numerous small gum creeks, which form the head of the north-eastern branch of the Field River. At seven and a half miles crossed a watershed, and entered a beautifully-grassed valley. At ten and a half miles we camped, several hours after sunset. Our camels are very leg-weary and seemed more inclined to rest than feed.

Tuesday 9th.—They, however, gave us some trouble during the night, and towards morning we were compelled to tie them down until daylight; my riding camel has become very vicious, and I am obliged to muzzle him to prevent being bitten. Continued on last night's bearing; at three miles ascended a hill, from which I had a good view towards the south and west. Started on a course of S.S.W.; at three-quarters of a mile, however, altered this to W.S.W., across a splendidly-grassed valley. At one and a half miles crossed a small gum creek, and at two and a half miles a rather large gum creek with a sandy bed; both creeks trend towards the southward. At five miles we passed some peculiar tent-shaped hills, composed of granite, slate, compressed sandstone, and porphyritic rocks; we also found several fine specimens of opal. The country now changes into well-grassed stony undulations; the stones are very distressing to our camels, whose feet have now become very tender and sore. At about ten miles ascended a high peak, from which I obtained an extensive view and a round of bearings, which enabled me to steer for a gap in the ranges near the Field River. After crossing the usual well-grassed country we arrived in the gap in five miles, and at seven miles struck the main creek, about one and three-quarter miles to the north of the camel camp (Alanajeer). My riding camel fell down several times during the last few miles; he is very leg-weary, and twice fell down the steep banks of the main creek. Shortly before reaching camp we disturbed a wild cat of an extraordinary size; the brute was nearly as large as a leopard. I have now completed my work, and nothing remains but to return to Sandringham Station; we accordingly made preparations for an early start to-morrow.

Wednesday, 10th.—The camels could not be found until late this morning, and we did not get under way before 10 a.m.; our course was about S.E. for one and a half miles to a gap in the range. I then changed to E.S.E., across sandy and well-grassed country. At three miles passed a few low stony hills. The country now changes into stony flats, splendidly grassed and well timbered with gidea. At four miles crossed a single sandridge; at eleven miles crossed a rather large gum creek trending towards the south; at thirteen and a half miles, top of very high and prominent peak, from which I obtained a good view all round. The country now again undergoes a change for the worse; it now consists of sand, which is covered with low mallee, wattle, and other bushes, and clumps of gidea and box trees; it is fairly grased; spinifex is also plentiful. At twenty-three miles camped near the foot of a low granite range, from which I obtained a round of bearings. A few drops of rain fell during the afternoon and night; the weather, however, continued very sultry and overcast, and I could obtain no observations.

Thursday, 11th.—Our camels are very foot-sore and tired; the stones have chipped large holes in the soles of their feet; several of them were quite knocked up last night. Started at about 6:30 a.m. on yesterday's bearing, across low stony and very scrubby undulations; at nine miles we again arrived at the sandridges, and although these are very steep and rather high, they are a great relief to our poor camels. Altered our course to east, and at two and a quarter miles, across spinifex sandridges, we arrived at Coonamucka Swamp, a large sheet of water about forty chains long and about the same width. This swamp apparently holds water for a long time after rain; the water at present is slightly stagnant, caused by the decomposition of vegetable matter which is carried into the lake or swamp by a small creek from the north-west; the swamp is dotted over with box trees, and the water in it at present is from one to four feet deep, and may last another four months during the present hot weather; it has already stood fully eight months. I found several curious and rare plants growing around the water's edge, the most remarkable being a carnivorous plant, of which

I secured several specimens for the Baron Ferdinand von Mueller, K.C.M.G., M.D. We continued our course of about S.E. for seven miles, across red spinifex sandridges and a few grassy and gum flats, to several large claypans, which the blackboy called "Warroo." I then altered our course to about S.S.E. At seven and a half miles, across red spinifex sandridges and fine well-grassed gidea (myall) flats, we camped some hours after sunset. It has been raining slightly during the afternoon, and the weather looks very threatening now.

Friday, 12th.—A little rain did fall during the night, just sufficient to cause discomfort. We managed to get a start this morning before 5 a.m., on a course of 150° , across high red sandridges covered with spinifex and a few low bushes and fine hard and well-grassed flats. At twenty and three-quarter miles we passed a claypan full of water; and half a mile further we pulled up at Etabucka, a small spring of very pure water, amongst a clump of timber situated between two high sandridges. The blackboy declared this spring to have no bottom; the surface water is about ten feet long, six feet wide, and one foot deep. I can form no idea as to the quantity of stock it would water without a proper test. I found four axes and a tomahawk buried at this spring. We continued our journey on a bearing of $132^{\circ} 15'$ for seven and three-quarter miles, across high spinifex sandridges and small grassy flats, to a Mitchell-grass and samphire plain, which is subject to inundation from the overflow of the Mulligan River and Sylvester Creek. Altered our course to about 104° . At two and a quarter miles we passed a point of low gypsum tableland; at four and a quarter miles we arrived at the eastern side of the plain and at the commencement of low spinifex sandridges and gidea flats; at five and three-quarter miles we crossed a wide flooded samphire flat, which forms the channel of the Mulligan River; and at six and three-quarter miles arrived at our old camp near Sandringham Station. It was about 9:30 p.m., and although all the dogs at the station turned out to welcome us after their fashion, no one else noticed our approach.

Saturday, 13th.—Our camels are completely knocked up with yesterday's stage, which was somewhat over forty miles; we arranged our camp to-day.

Sunday, 14th.—Obtained a few necessaries for the camp from the station and repaired the camels' saddles, which, being only made of jute bagging, are constantly the worse for wear, and require a tremendous amount of patching. The sudden change on to good food and vegetables has brought on severe dysentery.

Monday, 15th.—Repairing camel saddles and plotting up my plans, &c.

Tuesday, 16th.—Finished my plans roughly, and copied notes for diary, &c., and also made preparations for our final departure from Sandringham Station.

Wednesday, 17th.—We started this morning about 7:30 a.m., on a course of 65° , which I altered to 102° . At three-quarters of a mile crossed a well-grassed flooded flat—Mitchell grass, cotton and salt bush being abundant. At five and a half miles arrived at a large waterhole near the north point of a sandridge. The natives call this waterhole "Mataro." Altered our course to 80° for three and a half miles to red sandridge. I followed a buggy track for part of this distance, but lost it before reaching the sandridge. The country now consists of alternate single cane-grass and spinifex sandridges and hard stony flats, well grassed with Mitchell and various other grasses, cotton-bush, and saltbush, and well timbered with gidea. Altered our course to $2^{\circ} 30'$ for two and a half miles, along a stony flat, when, seeing no sign of the buggy track, we again changed our course to $147^{\circ} 30'$ for fourteen and three-quarter miles, to large waterhole in a break of a sandridge. Camped at this waterhole, which the natives call "Brinda." The weather is now again very hot. Observed for latitude, &c. The country passed over to-day is of the very best description.

Thursday, 18th.—An early start was made on a course of $111^{\circ} 30'$ for two and three-quarter miles, across a Mitchell-grass stony plain, to Kangaroota Waterhole, which is also situated at the north point of a sandridge. Changed course to 105° for two and three-quarter miles; thence $99^{\circ} 40'$ for one and a half miles, and 124° for two and three-quarter miles, to the Greensmith Creek, which I followed upwards on a bearing of 161° for two and a quarter miles. As I did not, however, see any signs of a station, I turned back at one mile. Met a horseman, who informed me that the station was two and a half miles further up the creek; returned and camped at the station. The weather is again fearfully hot; our camels' feet are bleeding, and they are quite unable to travel during the heat of the day. I am afraid they will give in altogether if we have many stones to travel over.

Friday, 19th.—I obtained some meat from this station, Palia, and then followed the creek down four miles to the point where I first struck it. I then continued on a bearing of 124° for one mile to east side of creek. Altered course to $160^{\circ} 30'$ for two and a half miles to a bend in the creek near a large waterhole called "Cootara." Changed course again to $174^{\circ} 40'$, across a flooded plain; at four miles, top of Kanoota sandridge, from which a good view of the Greensmith Creek is obtained. The creek eventually runs into Lake Phillipi, a very large and permanent fresh water lake several miles to the south. We continued to travel on various bearings across red stony plains. At eight and a quarter miles we crossed a low stony range, and at thirteen and a quarter miles camped in a small clay creek near some sandridges. We avoided the stones as much as possible, yet the camels are all lame, and we had great trouble to make them travel at all.

Saturday, 20th.—It was very sultry this morning. Started before 6 a.m., and travelled in all directions, sometimes north, then south, east, and west, following a wagon track which was to take us to the Herbert River. After travelling about thirteen and a half miles, across flooded gidea and gum flats, I arrived at Eyre's Creek Police Barracks, a dépôt for the black troopers on the Herbert River. I had to wait nearly three hours before the men with the other camels turned up; they had lost themselves. Crossed the Herbert River, and continued in an easterly direction across sandridges for five miles, and then across a flooded flat for five and three-quarter miles to King's Creek, where my camel threw himself down and refused to get up again; camped therefore on the east side of the creek and near a wire fence. We had a few drops of rain during the night.

Sunday, 21st.—Our blankets and other things are saturated by the rain, and we therefore camped here-to-day and dried them as soon as the rain ceased. The camels also require some rest; their feet are in a dreadful condition from crossing the last stony range; one riding camel is quite unfit to travel, and I am afraid to push on faster, as I should then have to leave him behind. Walked to the Cluny Station in the afternoon.

Monday, 22nd.—Started at 7 a.m.; at one mile passed Cluny or Narrowarry Station, where we were delayed about an hour and a half; we then followed the track which runs in an easterly direction around the points of several sandhills. At four miles passed a small waterhole, and at five miles, the track, after crossing a low spinifex and cane-grass sandridge, takes a sharp turn to the S.E., about, running along a stony flat between two sandridges. At thirteen and a half miles we arrived at an open plain, on which a few bunches

of Mitchell grass were visible; at seventeen and a half miles we passed a small waterhole; and at twenty-seven miles two camels gave in and had to be flogged and dragged to a waterhole, about half a mile further, at which we camped. A small station has been formed at this waterhole, which the natives call "Umpatabu."

Tuesday, 23rd.—We left Umpatabu Waterhole at 6 a.m., and followed the track, which is scarcely recognisable, in an easterly direction, across low spinifex and cane-grass sandridges and hard stony flats; at eleven and twelve miles, passed two small waterholes. One riding camel now gave in; after an immense amount of thrashing and dragging, we managed to get him along by short stages; at twenty-three and a half miles, however, he laid down and refused to stir an inch; we therefore camped close to a large waterhole which is about two hundred yards long and thirty yards wide.

Wednesday, 24th.—The sorefooted camel looked wretched this morning. We started at 6.30 a.m. travelling along the track in an easterly direction, over spinifex and cane-grass sandridges and wide bare stony flats. At three miles we arrived at a level plain, on which a few tufts of Mitchell grass were observable; at seven and half miles we passed a point of a low sandridge; at ten and half miles, crossed a gidgea watercourse, and shortly afterwards a small waterhole and several claypans full of water; at fourteen miles the sore-footed camel laid down, and we were forced to camp in an open stony salt and cotton bush plain, without any shelter against the hot sun and wind.

Thursday, 25th.—We had a few drops of rain in the early morning before daybreak, just sufficient to make things miserable. Started at 5.30 a.m., and at four and a quarter miles arrived at Monkarra Station; after half-an-hour's rest we continued along the track at a very slow pace, crossing the Diamantina or Mueller River, which is here nearly six miles wide. At eighteen miles the sore-footed camel gave in, and we had to camp. Overcast, very sultry, with a drizzling rain.

Friday, 26th.—Very stormy all night. Started at 5.15 a.m., walking most of the day. At sixteen miles we arrived at Tunko Waterhole and hut. This is an abandoned out-station of Monkarra. We camped here as the sore-footed camel did not feel inclined to go on. Very hot and sultry during the afternoon, which culminated in a thunderstorm and rain during the night.

Saturday, 27th.—Started at 5 a.m. from Tunko Waterhole; we travelled all day, giving the sore-footed camel an occasional rest. Camped at twenty-four miles.

Sunday, 28th.—Started at 5 a.m. At four and a half miles we entered the floodmarks of Farrar's Creek. At twelve and a quarter miles we arrived at Carrawilla Station, where I obtained sufficient meat to carry the party to Palparara Station; camped at twenty-one miles near a large rain waterhole. The sore-footed camel is slightly improving.

Monday, 29th. We started at 5.15 a.m. At thirteen and a quarter miles passed Mr. Weale's camp, Yeteterie Waterhole, and at sixteen and half miles arrived at Palparara Station, where I was employed for several days in plotting up my work and writing up my diary from notes taken in the field.

Friday, November 9th.—Started the camel back to Carrawilla.

Saturday, 10th.—Started with Mr. Adam Hay, about 9 a.m. At about nine miles measured the dimensions of an earth embankment; at twenty-five miles arrived at Carrawilla.

Sunday, 11th.—Arranged riding saddle and selected and packed two camels before breakfast. Started at 8.30 with Mr. A. Hay, and travelled all day. Camped at forty-one and a half miles, 8 p.m., in red mulga creek.

Monday, 12th.—Started at 6.30 a.m.; at twenty-one miles rested the camel for a few hours at an out-station of Haddon Down, at 8.30 p.m., having travelled thirty-six and a half miles, we camped at Kelpie Kelpie Waterhole.

Tuesday, 13th.—Started at 6 a.m., and travelled thirty-four and a half miles to Haddon. Rested two hours, then pushed on until 7.30. Camped at forty miles in expectation of a rain storm.

Wednesday, 14th.—Started at 5.30 a.m. At mid-day rested about three hours, then continued to travel until 9.30 p.m. Camped at forty miles.

Thursday, 15th.—Started at 5.15 a.m.; at twenty-five miles rested two hours, then travelled on until 10.30 p.m. Camped at forty-seven miles.

Friday, 16th.—Started at 5 a.m. Rested the camels two hours during the heat of the day. At 5.50 p.m. camped at Innamincka Station, forty-one miles; no feed for the camels.

Saturday, 17th.—Started at 7.30 a.m. Rested the camels two and a half hours during the heat of the day. At 12.15 a.m. camped, having travelled fifty-one miles; the last nine miles I walked on foot. No feed for the camels, who are nearly knocked up.

Sunday, 18th.—Started at 5.15 a.m.; various delays through meeting teams. Mr. A. Hay obtained a horse from them and pushed on to catch the Blanchewater mail. I brought on the camels by myself. At fifteen and a half miles camped, to give the camels, who are thoroughly knocked up, a rest.

Monday, 19th.—Started at 5 a.m.; the camels are very stiff; delayed greatly by the spare camel breaking his nose rope and keg. At sixteen and a half miles one camel refused to lead or go any further. Rested until 4 p.m., then continued along the track; at 7 p.m. arrived at Tinga-Tingana Station; at 8 p.m. continued my journey, and at 12 p.m. one camel again gave in, and finally upset himself in a claypan, nearly breaking his legs. Camped, tired to death; have lost all my rations in the dark. I must therefore postpone my meals until I arrive at the next station.

Tuesday, 20th.—The camels never moved from the camp last night, being too tired to feed. Started at 5.15 a.m. At 11 o'clock, after changing the riding camel several times, I arrived at a woolshed thoroughly knocked up. I here met several teamsters from whom I bought some rations, and then continued to travel until 12 o'clock. I camped for several hours, continued travelling in the evening; camped at 12 p.m., near Artraeona Well.

Wednesday 21st.—Started at 5 a.m. At nine miles arrived at Carraweena Station, where I again met Mr. Hay; we started in company about 6 p.m., and travelled until 10.30 p.m., then camped.

Thursday 22nd.—Started at 6 a.m. At five miles we arrived at Monte-collina; continued for another six miles, then camped during the heat of the day. Mr. Hay started at 1 p.m.; I started with the camels at 4 p.m. and travelled until 11.30 p.m.

Friday, 23rd.—Started at 5 a.m.; travelled eighteen miles across slightly stony plains; arrived at Blanchewater about 12.30, and where I again met Mr. Hay

Sunday, 25th.—Resting camels.

Monday, 26th.—Started with the camels about 3.30 p.m.; a few light showers of rain fell about sunset. At 11.30 p.m. camped.

Tuesday,

Tuesday, 27th.—A rough stormy night with showers of rain. Started after the camels at 4·30 a.m. soon found one. The other had broken his hopples and made back to Blanchewater. Tracked him about eleven miles to fence; then walked back to camp another eleven miles. Packed up and started 3 p.m., travelling until 12 p.m. Camped, tired to death.

Wednesday, 28th—A few drops of rain during the night; the camels had not left the camp this morning. Started at 4·45 a.m.; at two miles passed the Freeling eating-house, and at seven miles a hut and well, at which I watered the camels, but could not obtain any fresh water for myself. Continued along the track, which is very stony, in consequence of which I have to walk the greater part of the day. At nineteen miles passed the Knob Well and hut, and one mile further found some dirty sheeps' mud and water, at which I camped.

Thursday, 29th.—As usual, I had a few drops of rain during the night, just sufficient to make everything very uncomfortable. Started after the camels at day-break; found one, the other had again broken his hopples tracked him one and a half miles, which took me several hours, as the ground about here is very hard. I only made a late start as I also had to cook a damper, &c. Travelled until 5 p.m., when one camel knocked up; this compelled me to camp.

Friday, 30th.—A smart shower of rain fell in the early part of the night. Started from last night's camp at 5 a.m. At five and a half miles arrived at Mt. Lyndhurst, during a tremendous dust storm; filled my waterkeg and went on. At 10·15 p.m. the camels, as usual, jibbed, and I was compelled to camp, having travelled twenty-two miles, nearly the whole of which distance, with the exception of two miles, I walked.

Saturday, December 1st.—Started at 4·10 a.m., and arrived at the Gums, or Farina, just in time for lunch.

Sunday, 2nd.—Started after the camels at 4 a.m., and left the township about 8·45, the camels causing much delay; however, by resting them every few hours, I travelled without camping more than two hours at a time for two nights and three days, until I arrived at Beltana; from there I travelled by train to Adelaide.

CHAS. WINNECKE,

Leader Northern Exploring Expedition.

PLANTS COLLECTED IN CENTRAL AUSTRALIA,

Between lat. 22° 30' and 28° S., and long. 136° 30' and 139° 30' E., by

C H. WINNECKE, ESQ.,

DURING HIS EXPEDITION IN 1883;

EXAMINED BY

BARON FERD. VON MUELLER, K.C.M.G., M.D., Ph.D., F.R.S.

Lepidium papillosum, F. v. M.
Erysimum Blennodia, F. v. M.
Capparis Mitchelli, Lindley.
Capparis lasiantha, R. Brown.
Drosera Indica, Linné.
Owenia acidula, F. v. M.
Bergia perennis, F. v. M.
Tribulus Hystrix, R. Brown.
Zygophyllum Howitii, F. v. M. Petals about $\frac{1}{2}$ in. long; filaments without appendages; anthers when fully opened almost roundish; radicle often three times as long as the cotyledons.
Vrdium cygnorum, Nees.
Gossypium australe, F. v. M.
Lavatera pleboja, Sims.
Abutilon leucopetalum, F. v. M. A variety with yellow petals of nearly 2 in. in length; some of the stamens fully as long; upper part of the styles exserted; fruit not seen. This plant offers an approach to *A. exornatum*, Mons. Thozet, sent from Muellersville, specimens with flowers fully 3 in. long.
Melhania incana, Heyne.
Seringea integrifolia, F. v. M.
Triumfetta Winnekeana, F. v. M. Leaves roundish or verging into an oval form, denticulated and somewhat crisp at the margin, velvety on both sides; sepals narrow, dorsally terminated by a minute conical appendage, petals downy towards the base; stamens numerous; ovary three-celled; fruit large, on slender stalklet, almost globular, indehiscent, thinly tomentose, copiously beset with long spreading bristlelike, nearly glabrous at the summit, hooked prickles. The nearest affinity of this plant is with *T. leptantha*, but the fruits are much larger and not glabrous; indeed, they are in size similar to those of *T. procumbens*, but provided with longer and much more slender prickles. Leaves and flowers have been described from mere remnants adhering to the fruit.
Frankenia laevis, Linné.
Claytonia Balonensis, F. v. M.
Atriplex leptocarpum, F. v. M.
Atriplex Muelleri, Bentham, var. lobaticarpa; dwarf, prostrate or ascendent, leaves small; fruitbearing calyces minute, to the middle bivalved, digitate or flatellate, rhomboid, anteriorly cleft into five deltoid-semilanceolar lobules, the lateral of which divergent or recurved but often abbreviated, the lower portion of the fruit-calyx thickened towards the middle but not appendiculated. This may possibly require specific separation, but the degree of variability of the group of saltbushes to which this plant belongs needs yet further to be studied in the field or from augmented museum material. The plant here under consideration reminds us also of *A. fissivale*, from which it differs, in less succulence, smaller leaves, less transparent, and less deeply valvate fruit-calyces, with shorter lobules without dorsal appendages.
Kochia triptera, Bentham.
Salsola Kali, Linné. A variety with flowers and fruits crowded headlike on abbreviated branches; appendages of calyx minute.
Ptilotus latifolius, R. Brown.
Ptilotus alopecuroides, F. v. M.
Ptilotus abovatus, F. v. M.
Polygonum plebejum, R. Brown.
Prunex crystallinus, Lange. Some of the plants only 1 in. high, though fully in fruit.
Macgregoria racenigera, F. v. M.
Isotropis Winnekei, F. v. M., in Melb. Chemistry, Febr., 1884. An entirely new plant.
Crotalaria dissitiflora, Bentham.
Psoralea patens, Lindley.
Indigofera viscosa, Lamarck.
Swainsona laxa, R. Brown. A variety with somewhat larger flowers; lobes of the calyx considerably shorter than the tube, the two upper rather blunt; lateral petals dark violet-colored towards the summit; stipe of pod slightly longer than the calyx.
Glycine sericea, Bentham. Reminds of *Gelactia tenuiflora*.
Petalostylis labicheoides, R. Brown.
Bauhinia Leichhardtii, F. v. M., var. cinerascens. In this singular variety the rust-colored silky vestiture of the calyces and petals is replaced by a thin dull-greyish tomentum. The same form has been obtained on Julia Creek, a tributary of the Flinders River, by Mr. Armit; there particularly the petals become glabrescent. The leaflets are narrower than usual. Fruit for further comparison is not available. The far extratropic Bauhinia of Cooper's Creek is *B. Carronii*.
Neptunia gracilis, Bentham.
Acacia dictyophleba, F. v. M. Young pod broad-linear, viscid, straight, flat, not hairy, somewhat thickened at the margin; stipe short.
Calycothrix longiflora, F. v. M. This has recently been also collected within the limits of New South Wales, near the Warrego, by Mr. Beteche.
Melaleuca glomerata, F. v. M. Flowers small; tube of calyx thin-velvety, lobes short and blunt; petals tender-membranous, almost colorless, ciliolated, otherwise glabrous; stamens when dry pale-yellowish, five to seven in each bundle; the connate portion about as long as the petals, but much shorter than the free portions of the filaments.
Eucalyptus gamophylla, F. v. M. On the specimens now collected the upper leaves become narrow lanceolar, continuing opposite or getting scattered.
Eucalyptus microthea, F. v. M.
Lythrum hyssopifolium, Linné.
Amanannia multiflora, Roxburgh.
Haloragis Gosssei, F. v. M.
Didiscus glaucifolius, F. v. M.
Pimelia simplex, F. v. M.
Loranthus Quandang, Lindley.
Melothria Maderaspatana, Cogniaux.
Pomax umbellata, Solander.
Oldenlandia tillaeacea, F. v. M.
Dentella repens, Forster.
Calotis cynobanthus, F. v. M.
Calotis lappulacea, Bentham.
Vittadinia australis, Richard. Fruit specimens only 2 in. high.
Pterigeron adscendens, Bentham. A dwarf form with larger ligules of the ray-florets.
Epaltes australis, Lessing.
Myriocephalus Rudallii, F. v. M.
Myriocephalus Stuartii, Bentham.
Helipteron floribundum, Candolle.
Gnaphalium luteo-album, Linné.
Senecio Gregorii, F. v. M.
Wahlenbergia gracilis, A. de Candolle.
Isotoma petraea, F. v. M.
Brunonia australis, Smith.
Erythraea australis, R. Brown.
Duboisia Hopwoodii, F. v. M.
Solanum aligacanthum, F. v. M.
Nicotiana suaveolens, Lehmann. The flowers in some of the specimens less than an inch long.
Hemodia Morgania, F. v. M.
Justicia procumbens, Linné.
Ipomoea Muelleri, Bentham.

Cynanchum floribundum, R. Brown.
Pollia Zeilanica, F. v. M.
Halgnia cyanea, Lindley.
Methotropium flaginoides, Bentham.
Teucrium racemosum, R. Brown.
Clerodendrum floribundum, R. Brown.
Newcastlia spodiotricha, F. v. M. Found also by Mr. Kayser, at Eyre's Creek; by Mr. Giles, near the Alfie and Mary Range; and lately near Mount Everard. Corolla, deep blue.

Dicrastylis Dorani, F. v. M., var. *eriantha*; leaves narrower, conspicuously tomentose; glomerules of flowers two or more superposed along the stalks; calyces involved in a dense woolly vestiture; corolla as in the normal form almost bellshaped, its tube short and turgid, the lobes

obtuse. The Rev. H. Kemp sent a small-leaved variety from the Finke River.

Dicrastylis Lewellini, F. v. M. Tube of the corolla cylindrical, longer than the rather acute lobes; the fifth stamen between the two smaller corolla-lobes often altogether wanting, but sometimes developed and quite perfect. This, and other rare plants, brought by Mr. Winnecke, extend probably along sandy tracts of country into Queensland territory.

Eremophila Macdonnellii, F. v. M.

Eremophila Wilisii, F. v. M. A variety, with branches and leaves glabrous.

Eragrostis speciosa, Steudel. Fully in flower at less than 6 in. in height.

Aristida stipoides, R. Brown.

PLAN

Shewing

EXPLORATIONS BY MR WINNECKE

COPIED FROM HIS ORIGINAL PLANS IN THE OFFICE OF

THE SURVEYOR GENERAL

1884

SCALE
1 2 3 4 5 Miles
(1:423)

SURVEYOR GENERAL'S OFFICE, ADAMSTOWN, SOUTH AUSTRALIA.



